

U.S. Patent Application Serial No. 09/828,302
Response to Office Action
July 15, 2003
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41. (Cancelled)

42. (Currently amended) ~~The transgenic plant cell of Claim 41~~ A transgenic plant cell transformed with a nucleic acid encoding a polypeptide, wherein the ~~PHSRP is a PP2C-1 protein as polypeptide is~~ defined in SEQ ID NO:12.

43. (Currently amended) The transgenic plant cell of Claim ~~41~~ 42, wherein the ~~PHSRP encoding-nucleic acid comprises a~~ the polynucleotide as defined in SEQ ID NO:9.

44. (Currently amended) A transgenic plant cell transformed ~~by a Phosphatase Stress-Related Protein (PHSRP) coding with~~ a nucleic acid encoding a polypeptide, wherein the expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to an untransformed wild type variety of the plant cell; wherein the PHSRP-coding nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:9 and the full-length complement of the sequence of SEQ ID NO:9; ; and wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50°C.

45. (Cancelled)

46. (Currently amended) A transgenic plant cell transformed ~~by a PHSRP coding with~~ a nucleic acid, wherein the PHSRP-coding nucleic acid comprises a polynucleotide encoding a polypeptide having at least 80% 90% sequence identity with a polypeptide as defined in SEQ ID NO:14, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to an untransformed wild type variety of the plant cell.

47. (Currently amended) The transgenic plant cell of any of Claims 41, 42, 43, 44, or 46, wherein the plant is a monocot.

48. (Currently amended) The transgenic plant cell of any of Claims 41, 42, 43, 44, or 46, wherein the plant is a dicot.

49. (Currently amended) The transgenic plant cell of any of Claims 41, 42, 43, 44, or 46, wherein the plant is selected from the group consisting of maize, wheat, rye, oat, triticale, rice, barley, soybean, peanut, cotton, rapeseed, canola, manihot, pepper, sunflower, tagetes,

solanaceous plants, potato, tobacco, eggplant, tomato, Vicia species, pea, alfalfa, coffee, cacao, tea, Salix species, oil palm, coconut, and perennial grass, ~~and a forage crop~~.

50. (Currently amended) A transgenic plant comprising a the plant cell according to any of Claims ~~41~~, 42, 43, 44, or 46.

51. (Currently amended) A seed produced by a transgenic plant comprising a the plant cell according to any of Claims ~~41~~, 42, 43, 44, or 46, wherein the seed comprises the ~~PHSRP~~ nucleic acid encoding the polypeptide, wherein the seed is true breeding for an increased tolerance to an environmental stress as compared to a an untransformed wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and ~~low~~ temperature less than or equal to 0°C.

52. (Currently amended) An isolated ~~Phosphatase Stress Related Protein (PHSRP) coding~~ nucleic acid encoding a polypeptide, wherein the ~~PHSRP coding~~ nucleic acid comprises a polynucleotide that encodes a the polypeptide as defined in SEQ ID NO:14.

53. (Currently amended) The isolated ~~PHSRP coding~~ nucleic acid of Claim 52, wherein the ~~PHSRP coding~~ nucleic acid comprises a the polynucleotide as defined in SEQ ID NO:9.

54. (Currently amended) An isolated ~~PHSRP coding~~ nucleic acid; encoding a polypeptide, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to an untransformed wild type variety of the plant cell; wherein the ~~PHSRP coding~~ nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:9 and the full-length complement of the sequence of SEQ ID NO:9; and wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50°C.

55. (Cancelled)

56. (Currently amended) An isolated ~~PHSRP coding~~ nucleic acid, ~~wherein the PHSRP coding nucleic acid comprises a polynucleotide encoding a polypeptide having at least 80% 90%~~ sequence identity with a the polypeptide as defined in SEQ ID NO:14, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to an untransformed wild type variety of the plant cell.

57. (Currently amended) An isolated recombinant expression vector comprising ~~an PHSRP coding~~ the nucleic acid of Claims 52, 53, 54, or 56, wherein expression of the ~~PHSRP polypeptide~~ polypeptide in a plant cell results in the plant cell's increased tolerance to an environmental stress as compared to a an untransformed wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and ~~low~~ temperature less than or equal to 0°C.

58. (Cancelled)

59. (Currently amended) ~~The method of Claim 58, A method of producing a transgenic plant comprising a nucleic acid encoding a polypeptide, comprising,~~

- a. transforming a plant cell with the expression vector of Claim 57; and
- b. generating from the plant cell a transgenic plant that expresses the polypeptide;

wherein the ~~PHSRP is a PP2C-1~~ polypeptide as is defined in SEQ ID NO:14.

60. (Currently amended) The method of Claim 58 ~~59~~, wherein the ~~PHSRP coding nucleic acid expression vector~~ comprises a the polynucleotide as defined in SEQ ID NO:9.

61. (Currently amended) A method of producing a transgenic plant ~~containing a Phosphatase Stress-Related Protein (PHSRP) coding~~ comprising a nucleic acid encoding a polypeptide, wherein expression of the ~~PHSRP polypeptide~~ polypeptide in the plant results in the plant's increased tolerance to an environmental stress, as compared to a an untransformed wild type variety of the plant, comprising,

- a. transforming a plant cell with an the expression vector comprising the nucleic acid of Claim 57; and

b. generating from the plant cell a transgenic plant ~~with an increased tolerance to an environmental stress as compared to a wild type variety of the plant, that expresses the~~ polypeptide;
wherein the ~~PHSRP~~ coding nucleic acid hybridizes under stringent conditions to at least one sequence selected from the group consisting of the sequence of SEQ ID NO:9 and the full-length complement of the sequence of SEQ ID NO:9; wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X sodium chloride/sodium citrate (SSC), 0.1% SDS solution at 50°C; and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature less than or equal to 0°C.

62. (Cancelled)

63. (Currently amended) A method of producing a transgenic plant ~~containing a Phosphatase Stress-Related Protein (PHSRP) coding comprising a nucleic acid encoding a polypeptide,~~ wherein expression of the ~~PHSRP~~ polypeptide in the plant results in the plant's increased tolerance to an environmental stress, as compared to a an untransformed wild type variety of the plant, comprising,

- a. transforming a plant cell with ~~an~~ the expression vector ~~comprising the nucleic acid of Claim 57; and~~
- b. generating from the plant cell a transgenic plant ~~with an increased tolerance to an environmental stress as compared to a wild type variety of the plant, that expresses the~~ polypeptide;

wherein the ~~PHSRP~~ coding nucleic acid ~~comprises a polynucleotide encoding a polypeptide~~ having has at least 80% 90% sequence identity with a the polypeptide as defined in SEQ ID NO:14, and wherein the environmental stress is selected from one or more of the group consisting of drought and low temperature less than or equal to 0°C.